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TITLE: PERIPHERAL OPTICAL ELEMENT FOR CHANGING DIRECTION
OF LIGHT FROM LED

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ABSTRACT:

PROBLEM TO BE SOLVED: To efficiently collect the light from a LED and generate a high light intensity within a limited narrow observation angle to the optical axis by including a refracting surface and a reflecting surface forming first and second acute angles to the optical axis, respectively, and an emitting surface adjacent to these surfaces.

SOLUTION: The body 13 of an optical element 10 is symmetric to an optical axis Z. The optical element 10 is mounted on an LED 11 so that the bottom surface is situated on the carrier 12 of the LED 11. The LED is centered within an opening part having a width B within a bottom surface 17. A part of the light

emitted from the LED 11 or non-shielded light 22 is situated within a small angle to the optical axis Z, so that it is never shielded by the body 13 nor influenced by the operation of the optical element 10. The light having a large angle to the optical axis Z from the LED 11 or shielded light 20 is shielded by the refracting surface 16 of the optical element 10. The refractive index of the optical element 10 is higher than the medium around it, and the shielded light 20 is refracted, separated from the axis Z, and entered to the body 13. The light is total reflected by a reflecting surface 18 to form a smaller angle to the axis Z. The light leaves the body 13 through an emitting surface 14.

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